Fundamentals

This section covers the following topics:

- Components of Natural
- Invoking Natural
- Terminating Natural
- Using the ENTER Key
- Online Help System
- Navigating within Natural
- Main Natural Menus
- Natural Editors
- Terminal Commands
- Asterisk Notation

Components of Natural

Natural is a complete environment for application development, offering all the functions you need to create an application:

- the Natural programming language;
- editors to create and maintain programs, maps, data areas and the other types of programming objects that make up a Natural application;
- a utility to create and maintain error messages to be issued by an application;
- various utilities for online testing and debugging of individual programs as well as entire applications;
- several other utilities for various purposes which you will find helpful when developing an application with Natural.

All components of an application can be created and compiled online. No batch or asynchronous compilation or link steps are required to create a Natural application.

With Natural applications you can access data that may be stored in Adabas databases as well as in a wide variety of other database systems.

Invoking Natural

Natural may be invoked for online or batch mode execution.

The way you invoke Natural depends on the specific TP monitor environment at your site. Ask your Natural administrator how to invoke Natural.

If Natural Security is installed, the access to some libraries as well as the use of some functions may be restricted. Ask your Natural administrator for details.

Terminating Natural

- Terminating an Online Session
- Terminating a Batch Session

Terminating an Online Session

A Natural online session can be terminated by any of the following:

- pressing PF3 or entering a period (.) in the command line of the Main Menu,
- entering the system command FIN,
- pressing CLEAR or an equivalent key,
- executing a Natural program which contains a TERMINATE statement.

The method of session termination may also be modified by the Natural administrator.

Terminating a Batch Session

A Natural batch mode session will be terminated when one of the following is encountered during the session:

- a FIN command in the input dataset,
- an end-of-input condition in the input dataset,
- a TERMINATE statement in a Natural program which is being executed.

Using the ENTER Key

To perform a particular Natural action, you enter the appropriate function code, command, etc., and then press ENTER.

So, if this documentation tells you to "enter a function code", this means, "type in the function code and press ENTER".

If a function requires that you press another key, this will be explicitly mentioned in this documentation.

Online Help System

Natural offers several types of online help:

- Each menu has a help option which can be invoked by entering a question mark (?) or by pressing the appropriate PF key as indicated in the PF-key lines on the screen (usually PF1).
- Each editor provides help information, which can be invoked from within the editor.
- When an error message is displayed, there is help available which provides a detailed explanation of the message: Help on Natural System Messages

When you enter the system command HELP or a question mark (?), or press the PF key to which the function "Help" is assigned, this will invoke the help system from which you can select the help you want.

To get information on a specific statement or system command, you enter in the command line HELP followed by the name of the statement/command (for example, HELP STOW).

Some Natural screens provide field-specific help, which you get by entering a question mark (?) in a field.

With the LASTMSG command, you can display additional information about the error situation which has occurred last. See LASTMSG in the Natural Command Reference documentation.

Help on Natural System Messages

The system messages issued by Natural begin with NAT followed by a four-digit number *nnnn*.

For each Natural system message, there is a *short text* and a *long text*:

- The *short text* is the one-line message which is displayed when the error occurs.
- The *long text* is an extended explanation of the error and the action to be taken.

To display the long text, you place the cursor in the message line (that is, the line in which the short text of the message is being displayed) and press the help key (by default PF1). Or you enter the system command "HELP *nnnn*" or "? *nnnn*" (*nnnn* being the error number).

For further information on help for error messages, see the system command HELP in the Natural Command Reference documentation.

Navigating within Natural

- Invoking a Function from a Menu
- Invoking a Function with a Command
- Leaving a Function
- PF Keys

You can invoke a Natural function either by selecting it from a menu or by entering a command.

Invoking a Function from a Menu

Every Natural menu screen offers you a list of functions.

- On some menu screens, there is an input field before each function listed. To invoke a function, mark the corresponding input field - either with the cursor or with any character.
- On some menu screens, a one-letter code is displayed before each function listed. To invoke a function, enter the corresponding code in the Code field provided on the screen.

Invoking a Function with a Command

All Natural screens provide a "command line". The command line is usually above the PF-key lines and looks as follows:

```
Command ===>
```

In this line, you can enter a Natural system command. With a system command, you can invoke a function directly, instead of having to "work your way" towards it along a number of menu screens.

You can also enter a system command in response to a NEXT or MORE prompt in the same way as in the command line of a menu screen.

If no menu screen is displayed, you will get a NEXT prompt, indicating that Natural is awaiting your next input.

During the execution of a program, Natural will display a MORE prompt to inform you that additional output is available. To display the additional output, you press ENTER. If you enter a system command in response to the MORE prompt, the program that is being executed will be stopped and the system command will be executed.

The input of Natural commands (system, line, editor, etc.) is **not** case-sensitive.

For further information, see the Natural Command Reference documentation.

Leaving a Function

To leave a Natural function, you enter a period (.) or press PF3 or PF12 (see below).

PF Keys

By default, the following functions are assigned to the following keys throughout Natural:

Key	Function	Explanation
PF1	Help	Invokes the online help system.
PF2	Menu	Invokes the Main Menu.
PF3	Exit	Leaves a function and applies the changes made previously.
PF12	Canc	Leaves a function and cancels the changes made previously.

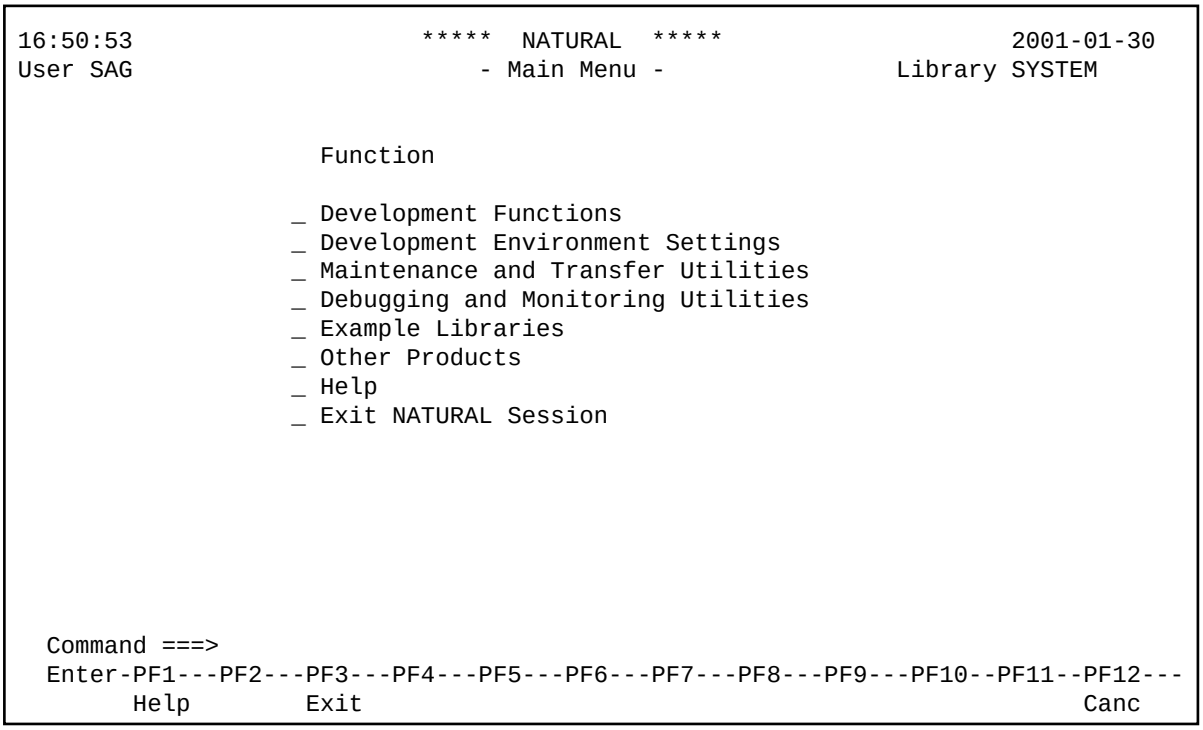
Main Natural Menus

- Main Menu
- Development Functions
- Changing the Library
- Programming Modes
- Development Environment Settings
- Maintenance and Transfer Utilities
- Debugging and Monitoring Utilities
- Example Libraries
- Other Products

Main Menu

When you invoke Natural, the Main Menu will be displayed.

If you get a NEXT or MORE prompt instead of the Main Menu, enter the system command MAINMENU. The Natural Main Menu will then be displayed.



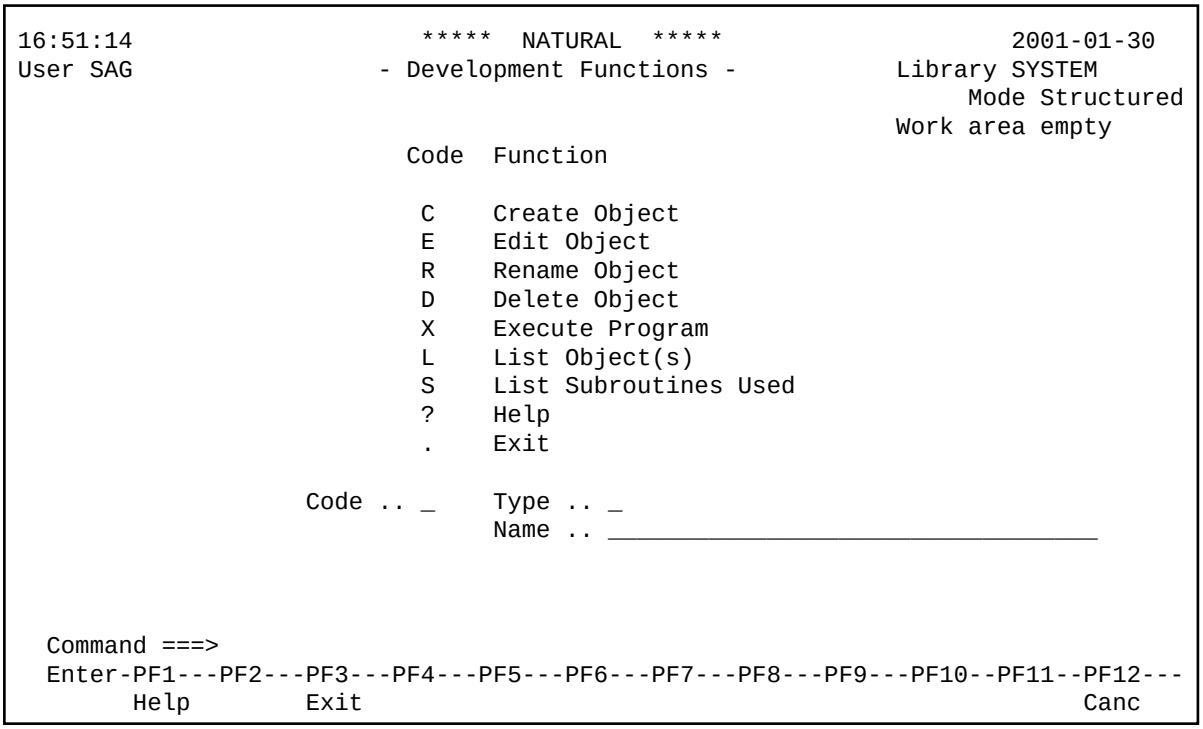
From the Main Menu, you can select one of the following functions:

Function	Explanation
Development Functions	Invokes a menu from which you can select various functions used to create and maintain programs, maps, data areas and the other components that make up a Natural application.
Development Environment Settings	Invokes a menu from which you can select various functions which allow you to display and modify various settings that affect your Natural session.
Maintenance and Transfer Utilities	Invokes a menu from which you can select various functions used to create and maintain certain objects or transfer them to another environment.
Debugging and Monitoring Utilities	Invokes a menu from which you can select various functions used to monitor your Natural applications and locate errors in their processing flow.
Example Libraries	Invokes a menu from which you can select various libraries containing example programs and user exits.
Other Products	Invokes a menu from which you can invoke several other Software AG products.

The position and color of the message line and PF-key lines on the main menu and its subordinate menus can be changed with the user exit USR2003 (which is provided in the library SYSEXT).

Development Functions

When you select "Development Functions" on the Natural Main Menu, the Development Functions menu is displayed:



The functions listed on this menu are some of the functions you will need most frequently when you develop an application with Natural.

You can select a function from the Development Functions menu in three ways:

- **Input Fields**
  You can enter the corresponding function code in the Code field.
  To perform a function on a programming object which already exists, you enter the desired function code in the Code field and the name of the programming object in the Name field.
  Some functions require that, in addition to entering the corresponding function code in the Code field, you enter an object type in the Type field. If you fail to do so, a window will automatically be displayed from which you can select an object type.
  Once you are familiar with the object type codes displayed in the window, you can enter them directly in the Type field on the menu.
  The various object types are described in the section Object Types of the Natural Programming Guide.
  If you know the name of the object you wish to deal with, you can enter it in the Name field (without having to enter any Type).
  If you invoke the function "Edit Object" or "List Object(s)" without specifying a name or object type, the current contents of the source work area will be displayed.

- **PF Keys**
  You can press a PF key to invoke a function.
  The PF-key lines at the bottom of the screen indicate which function is assigned to which key.

- **Command Line**
  You can enter a Natural system command in the command line as described earlier under in the section Invoking a Function with a Command.
  In general, the format of the commands corresponds to the Code/Name sequence. For example, to edit an existing program named PROGX, you would enter "E" in the Code field and PROGX in the Name field. The equivalent system command to be entered in the Command line would be EDIT PROGX.
  For further information, see the Natural Command Reference documentation.

The Development Functions menu provides the following functions:

Function	Explanation
Create Object	With this function, you can create a new Natural programming object (program, map, data area, etc). You have to specify the type and the name of the object to be created. The appropriate editor will then be invoked: program editor, map editor, or data area editor.
Edit Object	With this function, you can modify the source code of an existing programming object. You have to specify the name of the object to be edited. The appropriate editor will then be invoked: program editor, map editor, or data area editor. If you do not remember the name, you can use the function "List Object(s)" (see below).
Rename Object	With this function, you can change the name of a programming object. This function is equivalent to the system command RENAME as described in the Natural Command Reference documentation.
Delete Object	With this function, you can delete one or more programming objects. This function is equivalent to the system command DELETE as described in the Natural Command Reference documentation.
Execute Program	With this function, you can execute a Natural object of type program. You have to specify the name of the program to be executed. Other object types cannot be executed by themselves, but must be invoked from another object. This function is equivalent to the system command EXECUTE as described in the Natural Command Reference documentation.
List Object(s)	This function allows you to select from a list the programming object you wish to edit. This function is equivalent to the system command LIST as described in the Natural Command Reference documentation.
List Subroutines Used	With this function, you can ascertain which programming objects in the current library use which external subroutines. This function is equivalent to the system command ROUTINES as described in the Natural Command Reference documentation.

Changing the Library

In the top right-hand corner of the Development Functions menu is a Library field, which indicates the ID of your current library, that is, the current library where programming objects are stored and from which they are retrieved.

The library ID is in effect until you change it, or until the end of your Natural session. The default library ID assigned by Natural is "SYSTEM".

On the Development Functions menu, you can change libraries by overwriting the library ID displayed in the top right-hand corner with another library ID.

Generally, you can change libraries anywhere in Natural by entering the following system command in the command line:

LOGON *library-ID*

where *library-ID* is the ID of the library you want to access.

Programming Modes

Natural offers two ways of programming: reporting mode and structured mode. Generally, it is recommended to use structured mode exclusively, because it provides for more clearly structured applications. Therefore all explanations and examples in the Natural User’s Guide for Mainframes refer to structured mode. Any peculiarities of reporting mode will not be taken into consideration. (For differences between the two modes, refer to the section Reporting Mode and Structured Mode in the Natural Programming Guide.)

In the top right-hand corner of the Development Functions menu is a Mode field, which indicates the programming mode currently in effect: "Structured" or "Reporting".

To change the mode, you overwrite the first position of the Mode field with an "S" (for structured mode) or an "R" (for reporting mode).

Development Environment Settings

When you select "Development Environment Settings" on the Natural Main Menu, a menu with the following functions is displayed:

Function	Description
Function-Key Settings	With this function, you can assign functions to PF keys to be used in your Natural session. Corresponding command: KEY
Compilation Settings	With this function, you can set various options that affect the way in which Natural programming objects are compiled. Corresponding command: COMPOPT
Session Parameter Settings	With this function, you can change the settings of various Natural session parameters. Session parameters are described in the Natural Parameter Reference documentation. Corresponding command: GLOBALS.
Profile Parameter Settings	With this function, you can change the settings of various Natural profile parameters. Profile parameters are described in the Natural Parameter Reference documentation and in Profile Parameter Usage in the Natural Operations for Mainframes documentation. The command SYSPARM invokes a utility of the same name. The SYSPARM utility is described in the Natural Utilities for Mainframes documentation. Corresponding command: SYSPARM.
Technical Session Information	This function displays various items of technical information on your Natural session. Corresponding command: TECH.
System File Information	This function displays the current definitions of the Natural system files. Corresponding command: SYSPROF.
Product Installation Information	This function displays a list of the products installed at your site and some information on these products. Corresponding command: SYSPROD.
Security Profile Information	This function displays the security profile currently in effect for you. (This function is only available if Natural Security is installed.) Corresponding command: PROFILE.

To invoke a function from the menu, you mark the corresponding input field - either with the cursor or with any character.

You can also invoke each function via a corresponding system command (as indicated in the table above). The system commands are described in the Natural Command Reference documentation.

For details on each function, refer to the description of the corresponding system command or utility.

Maintenance and Transfer Utilities

When you select "Maintenance and Transfer Utilities" on the Natural Main Menu, a menu with the following utilities is displayed:

Function	Description
Maintain Error Messages	With this utility, you create and maintain the messages you wish to issue in your Natural applications. Corresponding command: SYSERR (*).
Maintain DDMs	With this utility, you create and maintain the data definition modules (DDMs), that is, the logical definitions of the database files you wish to access in your Natural applications. For a detailed explanation of DDMs, see the section Database Access in the Natural Programming Guide. Corresponding command: SYSDDM (*).
Maintain Command Processors	With this utility, you create and maintain the command processors you wish to use in your Natural applications. Corresponding command: SYSNCP (*).
Maintain Remote Procedure Calls	With this utility, you create and maintain remote procedure calls, that is, provide the settings necessary to execute a Natural subprogram located on a remote server. Corresponding command: SYSRPC (*).
Transfer Objects to Other Libraries	With this utility, you can transfer Natural programming objects, error messages, DDMs and several other objects from one library to another. Corresponding command: SYSMAIN (*).
Transfer Objects to Other System Files	With this utility, you can transfer Natural programming objects, DDMs and error messages from one system file to another. Corresponding command: SYSUNLD (*).
Transfer Objects to Other Platforms	With this utility, you can transfer Natural programming objects, DDMs, error messages and Adabas FDTs from one hardware platform to another. Corresponding command: SYSTRANS (*).

* Each of these commands invokes a utility or application of a corresponding name. For a description of the utilities see the Natural Utilities for Mainframes documentation or refer to the list of utilities on the overview page of Natural for Mainframes.

To invoke a function from the menu, you mark the corresponding input field - either with the cursor or with any character.

You can also invoke each function via a corresponding system command (as indicated in the table above).

For details on each function, refer to the description of the corresponding system command or utility.

Debugging and Monitoring Utilities

When you select "Debugging and Monitoring Utilities" on the Natural Main Menu, a menu with the following utilities is displayed:

Function	Description
Debugging	With this utility, you can search for errors in the processing flow of programs. Corresponding command: TEST.
Logging of Database Calls	With this utility, you can log database commands. Corresponding command: TEST DBLOG.
Issuing Adabas Calls	With this utility, you can pass Adabas commands directly to the database. Corresponding command: SYSADA (*)
Buffer Pool Maintenance	With this utility, you can monitor the Natural buffer pool and adjust it to meet your requirements. Corresponding command: SYSBPM (*).
Editor Buffer Pool Maintenance	With this utility, you can monitor the buffer pool of the Software AG Editor and adjust it to meet your requirements. Corresponding command: SYSEDT (*).
TP-Specific Monitoring	With this utility, you can monitor and control various TP-monitor-specific characteristics of Natural. Corresponding command: SYSTP (*).
Data Collection and Tracing	With this utility, you can collect monitoring and accouting data about the processing flow of a Natural application. Corresponding command: SYSRDC (*).
Error Information on Abnormal Termination	This function provides information for Software AG Technical Support required for error diagnosis. Corresponding command: DUMP.

You can also invoke each function via a corresponding system command (as indicated in the table above). The system commands are described in the Natural Command Reference documentation.

* Each of these commands invokes a utility or application of a corresponding name. For a description of the utilities see the Natural Utilities for Mainframes documentation or refer to the list of utilities on the overview page of Natural for Mainframes. SYSEDT is described in the Natural Operations for Mainframes documentation.

To invoke a function from the menu, you mark the corresponding input field - either with the cursor or with any character.

You can also invoke each function via a corresponding system command (as indicated in the table above).

For details on each function, refer to the description of the corresponding system command or utility.

Example Libraries

When you select "Example Libraries" from the Natural Main Menu, a list of libraries containing example programs and user exits provided by Software AG will be displayed:

Library	Contents
SYSEXPG	This library contains the example programs shown and referred to in the Natural Programming Guide.
SYSEXRM	This library contains the example programs shown and referred to in the Natural Command Reference documentation and the Natural Statements documentation.
SYSEXV23	This library contains example programs which illustrate some of the new features provided with Version 2.3 of Natural.
SYSEXT	This library contains various Natural user exits; see also the system command SYSEXT as described in the Natural Command Reference documentation.
SYSEXTP	This library contains various Natural user exits for specific functions that apply only under certain TP monitors.

To display the contents of a library, you mark the corresponding input field - either with the cursor or with a character.

Other Products

When you select "Other Products" from the Natural Main Menu, a list will be displayed showing the Software AG products installed at your site which can be invoked via Natural and to which you have access.

To invoke a product, you mark the corresponding input field - either with the cursor or with a character.

Natural Editors

Natural provides three editors: the program editor, the data area editor, and the map editor.

The type of programming object to be edited determines the editor you will use. When you specify a programming object by name, the appropriate editor is automatically invoked.

- Program Editor - This editor is used to create and maintain programs, subroutines, subprograms, helproutines, copycodes and texts.
- Data Area Editor - This editor is used to create and maintain global data areas, local data areas, and parameter data areas.
  This editor has a columnar format that is designed for defining the data used in Natural programs or routines.
- Map Editor - This editor is used to create and maintain maps (screen layouts) referenced in a program's INPUT or WRITE statement.
  The map editor allows direct manipulation of the fields used in an input or output map; the extended field editing feature facilitates the definition of fields; moreover, processing rules can be attached to fields in the map.

All editors can be operated in split-screen mode so that a portion of the screen can be used to display related objects. While creating or editing a map in the map editor, for example, you may have DDM fields displayed and transfer these fields into the map.

Examples for the use of editors are provided in the sections Tutorial - Getting Started with Natural and Tutorial - Using the Map Editor.

For further general information, see the section Editors - General Information.

Terminal Commands

Natural terminal commands are used to perform a wide variety of functions.

All terminal command begin with a percent sign (%).

The Natural Programming Reference documentation contains a description of each terminal command. See Terminal Command List or Terminal Commands Grouped by Function.

Note:
Within a program, you can assign terminal commands to function keys by using the SET KEY statement. With the system command KEY you can also assign terminal commands to functions keys. See also (Terminal Command) Key Assignments in the Natural Programming Reference documentation.

Asterisk Notation

Many Natural functions display lists of objects. Usually, these lists contain all objects available (for example, all objects of a given type, all objects in a given library). If you do not wish all objects to be listed, but only a certain range of objects, you may specify that range by using *asterisk notation*:

By specifying a parameter value followed by an asterisk (*) you will get a list of only those objects whose names (or IDs or whatever the parameter is) begin with that value. This option to enter a value followed by an asterisk is referred to as *asterisk notation*.

Example 1:

If you enter the system command DELETE without any parameters:

```
DELETE
```

you will get a list of all objects in the current library (you can then mark those which are to be deleted).

Example 2:

If you enter the system command DELETE as follows:

```
DELETE DAWG*
```

you will get a list of only those objects in the current library whose names begin with DAWG.

